

Power for Vehicle Embedded MEMS Sensors, Phase I

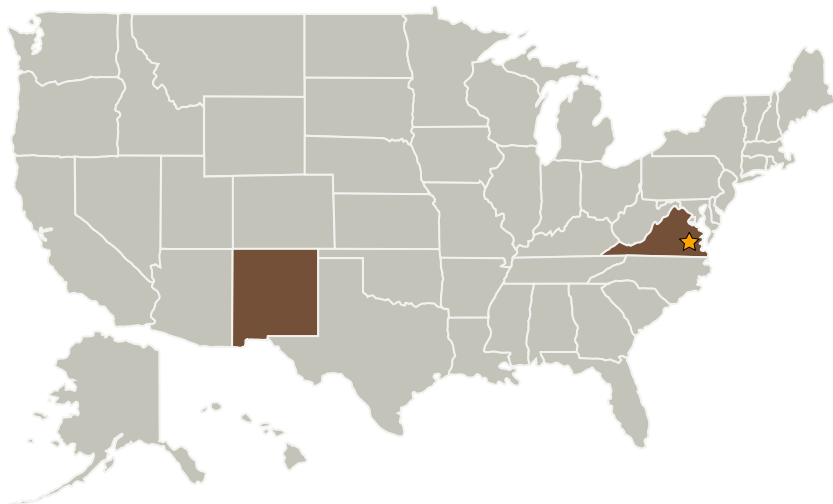
Completed Technology Project (2005 - 2005)



Project Introduction

Embedded wireless sensors of the future will enable flight vehicle systems to be "highly aware" of onboard health and performance parameters, as well as the external flow field and potential threat environments. Because there will be no opportunity to replace batteries on a regular basis, these systems will have to rely on energy harvesting strategies to convert ambient energy into electrical energy to provide long-lived power. TPL proposes to develop a MEMS-scale power system that will combine TPL's patented volumetric electrochemical micro-devices (microbatteries and microsupercapacitors) with energy harvesting for long lived power. Volumetric electrochemical devices are a unique and critical feature of our approach, which provide energy storage capabilities and high power density to minimize the total volume and footprint of the micropower system. The proposed effort will evaluate designs combining microbatteries, microsupercapacitors and energy harvesting devices with respect to the trade-offs between size, maximum power, duty cycle, and energy source availability. TPL's partner, the Johns Hopkins University Applied Physics Laboratory (JHU/APL), brings expertise in the space arena, and will provide technical guidance and advice on sensor requirements, integration and packaging for space. This partnership will be critical to realizing space-qualified devices.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
TPL, Inc.	Supporting Organization	Industry	Albuquerque, New Mexico

Primary U.S. Work Locations

New Mexico	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Charles D Lakeman

Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.2 Mobility
 - └ TX04.2.2 Above-Surface Mobility